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JUGGLING CATCHES ON!

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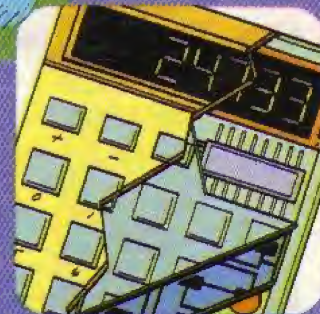


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Cover Photo © James Nachtwey/Magnum



PHOTO: FPG INTERNATIONAL/ALF MACKSON

Batters "knuckle under" when they face Joe Niekro.

Knuckleball Know-how

What kind of baseball pitch drives batters crazy? The knuckleball! Sometimes a knuckleball seems to head straight for home plate. At the last instant, it wobbles and swerves out of reach. The batter swings—and misses. Strike! At other times, a knuckleball seems to flutter and zigzag all the way to home plate. Knuckleballs are almost impossible to hit.

Joel Hollenberg is a baseball fan and a professor of mechanical engineering. Like many other scientists he had been puzzled by the knuckleball. Nothing in the rules of aerodynamics (the study of how objects move through the air) seemed to explain how it worked.

Dr. Hollenberg used wind tunnels and computers to study knuckleballs. His conclusion? The stitches on the ball resist the wind and make the ball swerve!

Now Dr. Hollenberg hopes to make the lives of batters even harder. He is developing a computer program to teach pitchers how to throw a better knuckleball!

Space Junk Buster

It's hard enough keeping your own room neat, right? Well, scientists have a much bigger problem on their hands—cleaning up outer space!

Old satellites, booster rockets, and other pieces of space junk are beginning to clutter up our atmosphere. And scientists fear that the orbiting garbage could crash into spaceships. Or it could fall to Earth and cause serious damage.

An engineer at the University of Arizona has designed a neat solution: an orbiting junk-collecting robot! It's still just an idea, but someday there may be a robot in space with an arm to pull in the garbage. The robot would also have a storage bin and a big mirror. The mirror would focus sunlight on huge chunks of space junk. This would cut them into smaller pieces that the robot could handle.



ILLUSTRATION BY MARY DUARTE



ILLUSTRATION BY CAMERON EAGLE

Bee-Ware!

"Buzz off!"

That's the message the U.S. government wants to send to the so-called "killer" bees in South America. Why? Because this new breed of honeybee makes very little honey. They also attack animals and sometimes they attack humans. Each year the bees have been travelling farther and farther north.

U.S. bee-farmers worry that these bees will be here soon. But the U.S. Department of Agriculture has a plan to keep them out.

Scientists are setting up a kind of bee wall. It's a series of bee traps spread out across the narrowest part of Mexico. The traps are boxes with a special scent that the nasty bees like. Attracted by the scent, the bees make their hives in the boxes and settle in.

The scientists aren't just setting traps. They're also flooding this part of Mexico with gentle European bees. They hope that these bees will mate with the meaner bees. Their offspring, U.S.D.A. experts think, will be, um, better beehived!

Story suggested by Adam Risius, Des Moines, IA

Soar with Eagles

What's the latest wrinkle in daredevil sports? How about trapping on a pair of skis and slipping two cloth wings onto your ski poles?

We're not kidding—oversized human butterflies can get off the ground. Dave Toland, the man who came up with the idea, thinks it's a great way to fly. He says that all it takes is some downhill speed and a stiff wind to set you soaring. We'd say you could use a lot of luck, too!

Animal Crackers

Next time someone tells you that you're a fussy eater, you can say: "I'm not as bad as a koala!" The picky koala will only eat the leaves of the eucalyptus (you-kuh-LIP-tuss), an Australian tree.

That makes life tough for zookeepers, because fresh eucalyptus leaves are hard to get. But Ian Hume, an Australian biologist,

may have the answer. He's found a way to make a eucalyptus leaf cookie that lasts a lot longer than fresh leaves. And only half the cookie recipe calls for eucalyptus.

Who's doing the taste-testing? Koalas, of course. And according to Hume, he has five out of his six koalas living on nothing but leaf-cookies!

Healthy Beat

Try this rap song. Say it out loud and in rhythm:

I'm your heart and I'm falling apart,

If you look at me I'm a dirty work of art,

Nicotine and tar are shutting me down,

If you don't stop smoking I'll be six feet underground!

The rap group that wrote this song isn't famous like RUN DMC. They're four sixth-graders from Iowa! An Iowa hospital had a contest for songs about health, and

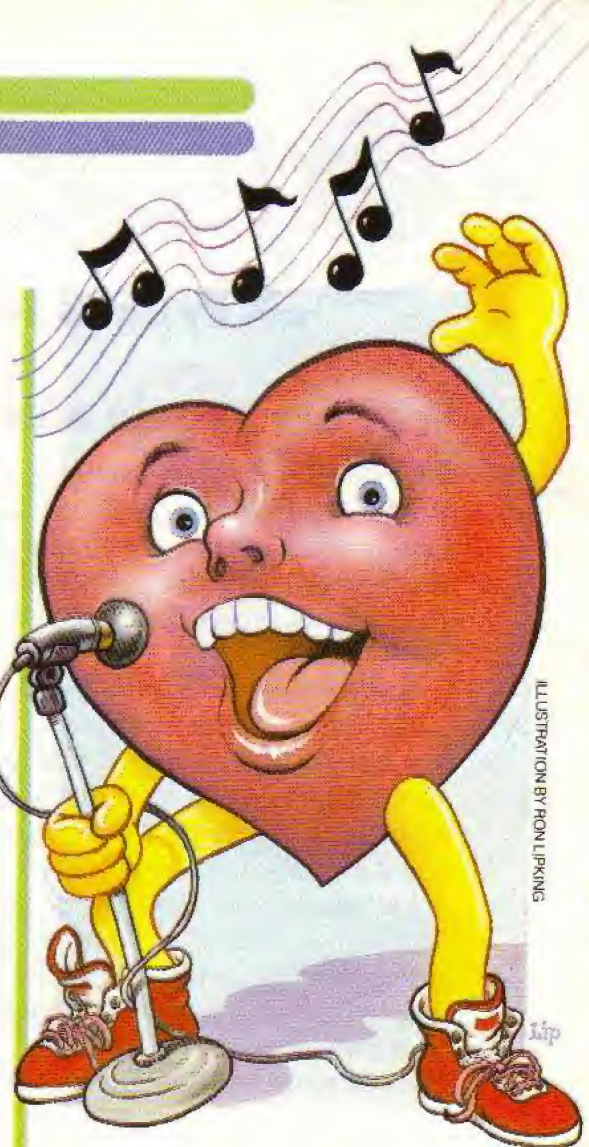


ILLUSTRATION BY RON LIPKING

this song was one of the winners.

WHO, an Iowa radio station, has been playing the winning songs. The contest sponsors hope that the hard-driving beat of the songs will help drive home the message and lead to healthier heartbeats for everyone.

So What's New?

You tell us and you'll get a nifty CONTACT T-shirt—if we print your story. Send us any science stories from the news that you think our readers would like to know about. (Be sure to tell us where you heard the story.) Send to:

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1 Lincoln Plaza
New York, NY 10023



PHOTO: H. ARMSTRONG ROBERTS

Any Questions?

by David Weiser

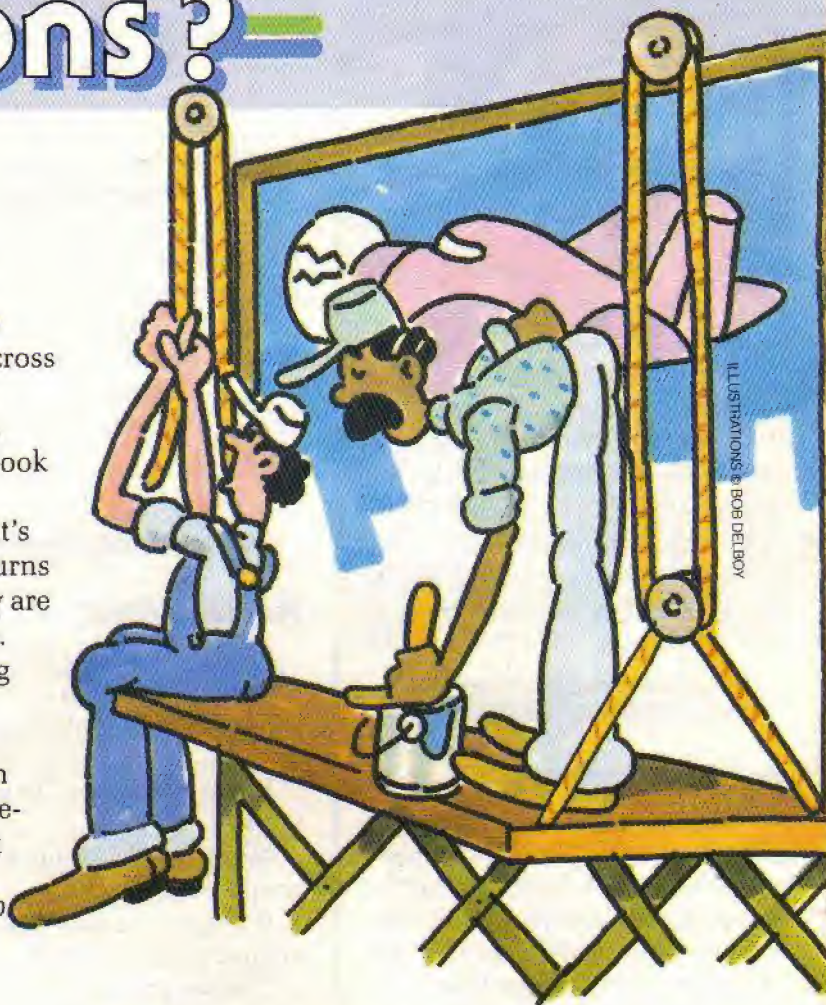
Why are people afraid of heights?

You're watching an adventure movie. The hero and her friend are edging across a ledge at the top of a skyscraper. The hero's friend begins to panic. He's afraid of heights. The hero says three soothing words: "Don't look down."

Is she kidding? What help is that? In fact, it's good advice. People with fear of heights, it turns out, are really not afraid of high places. They are afraid of falling over the edge of a high place. Not looking down helps them avoid thinking about how close to a fall they are.

Let's face it—this is a pretty sensible fear! Some scientists believe most people are born with a fear of heights. It is a kind of safety precaution that keeps us out of danger. So don't look down!

Question sent in by Alysén Espersen, Glen Burnie, MD



Why are lemons sour? Did your mouth pucker when you read that question? If so, it's probably because you remember the strong, sour taste of a lemon.

Lemons taste sour for two reasons. First, lemons contain a chemical, citric acid. That's what gives lemons their sourness. Oranges, grapefruits, and other citrus fruits contain the acid, too. Pineapples also have some citric acid. How sour a fruit is depends on how much citric acid it contains. Lemons are about seven percent citric acid.

The second reason lemons taste sour is because of your taste buds. These tiny bumps in your tongue have specialties: one group tastes salty foods, a second group tastes sweet, a third group bitter, and the fourth sour foods. When the citric acid touches the sour taste buds they send a "sour taste" signal to your brain.

Question sent in by Kris Gricus, East Greenwich, RI.

Do you have a question that no one seems able to answer? Why not ask us? Send your question, along with your name, address, and age, to:

Any Questions?
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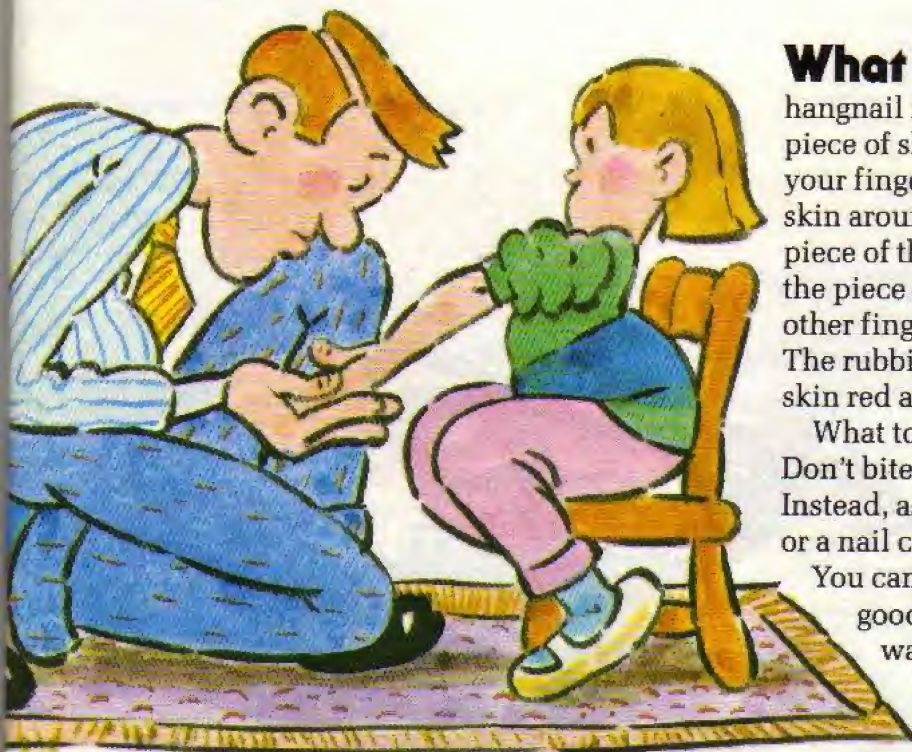
What is the Bermuda Triangle?

Some people say the Bermuda Triangle is the "twilight zone" of the ocean where weird disasters happen. It is a large triangular area of the Atlantic Ocean formed by drawing an imaginary line from Florida to Bermuda to Puerto Rico and back to Florida.

According to true believers, more than 100 ships and planes have disappeared in the triangle without a trace. In many of the cases, they claim, no calls for help were received. Reasons for these "disappearances" range from kidnappings by visitors from outer space to unusual electromagnetic forces on the ocean floor.

Most scientists say the explanation is a lot simpler. The Bermuda Triangle is a very stormy part of the Atlantic. It's not unusual that many ships and planes could be lost in storms at sea.

Question sent in by John Wober, Bolingbrook, IL.



What is a hangnail? First of all, a hangnail is not really a nail. It is a tough little piece of skin that hangs loosely at the side of your fingernail. You get a hangnail when the skin around the nail gets a little dry. Then a piece of the skin might start peeling off. Soon the piece of skin starts rubbing against your other fingers or against objects that you touch. The rubbing irritates the hangnail and makes the skin red and sore.

What to do with a hangnail? Don't pick it! Don't bite it off! That will only make it worse. Instead, ask an adult to cut it off with scissors or a nail clippers.

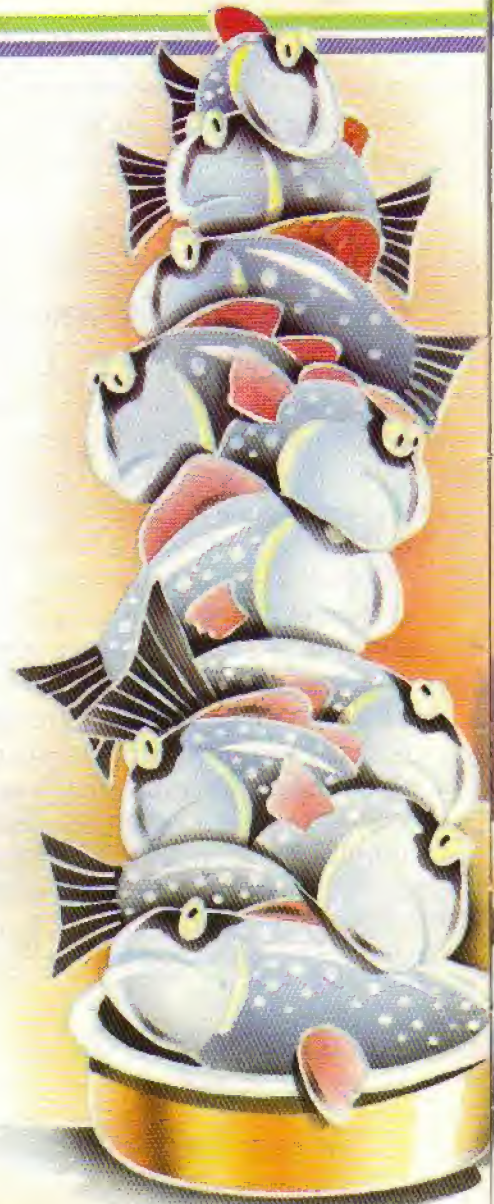
You can avoid getting hangnails by taking good care of your hands and nails. After washing your hands, dry them well. Use lotion to keep dry skin smooth.

Question sent in by Sarah Roman, Columbus, OH.

Factoids



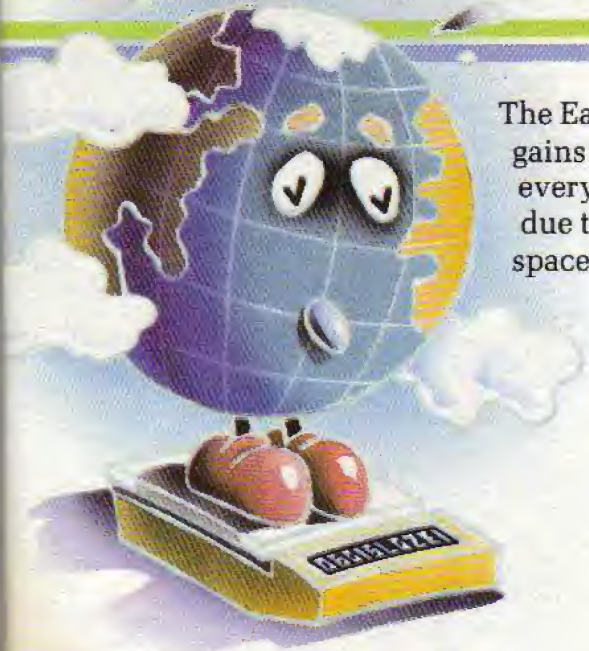
In an average night, a boy sleeps
10 minutes more than a girl.



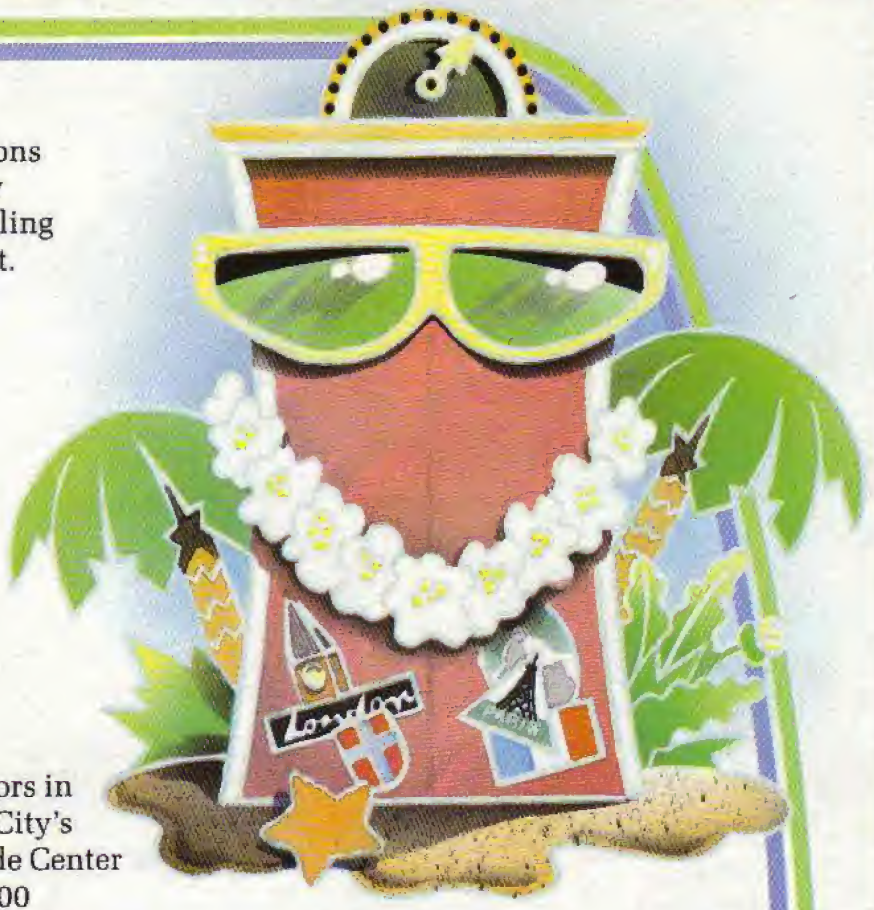
In the U.S., cats eat
300 million pounds of
canned fish every year.



A blue whale's
tongue is as long
as a small car.



The Earth gains 10 tons every day due to falling space dust.



The elevators in New York City's World Trade Center travel 35,000 miles each year.



Panther, puma, catamount, cougar, mountain lion and bearcat are all names for the same animal.



You move your eyes about 100,000 times every day.



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c r r o d r
t r e e s m

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They spell two words. Can you
put them in the right order?

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The Tyrannosaurus
(ti-ran-o-SAW-rus) was 40 feet
tall and had very sharp teeth
and claws. Tyrannosaurus
means king of the reptiles.

t r e e s
c r r o d r
b u g s u a
p o d a b w

ANSWERS:
Sid the Owl's Famous Brainteasers: Flower
Smilin' Sam's Joke-O-Rama: Fun Fruity Chumbers!
Lettermania: SPRING FEVER
Crazy Words: p o d a b w
t r e e s

JUGGLING!

IT'S CATCHING!

by Eric Weiner



PHOTO: BILL FARRELL/ARUNZ JUGGLERS

There's something new in the air—balls, clubs, rings, apples, bean bags, boxes, marbles, plates and plastic chickens! No, the world hasn't turned topsy-turvy. It's just that more and more people are juggling!

Juggling used to be something people did only at the circus. But today, kids are forming juggling clubs in school. Jugglers are teaching adults to juggle as a way to relax. Athletes are juggling while they run so that their arms get as much exercise as their legs. (They call it "jog-gling.") And jugglers are meeting and competing.

Claude Shannon, a famous mathematician who has studied juggling, told CONTACT: "Juggling three things is really pretty easy to learn—if you go about it the right way." (See our juggling instructions at the end of this story.)

Danny Schwager, 16, agrees. Said Danny, "Everyone in my class who has really tried to learn, has learned."

A Class Act

Danny and Pete Kushel, 15, teach juggling at the Chatsworth Elementary School in Larchmont,



PHOTO © ROGER V. DOLLAR/HIDE

Above: If you want to win a "jogging" race, you better not drop a ball.

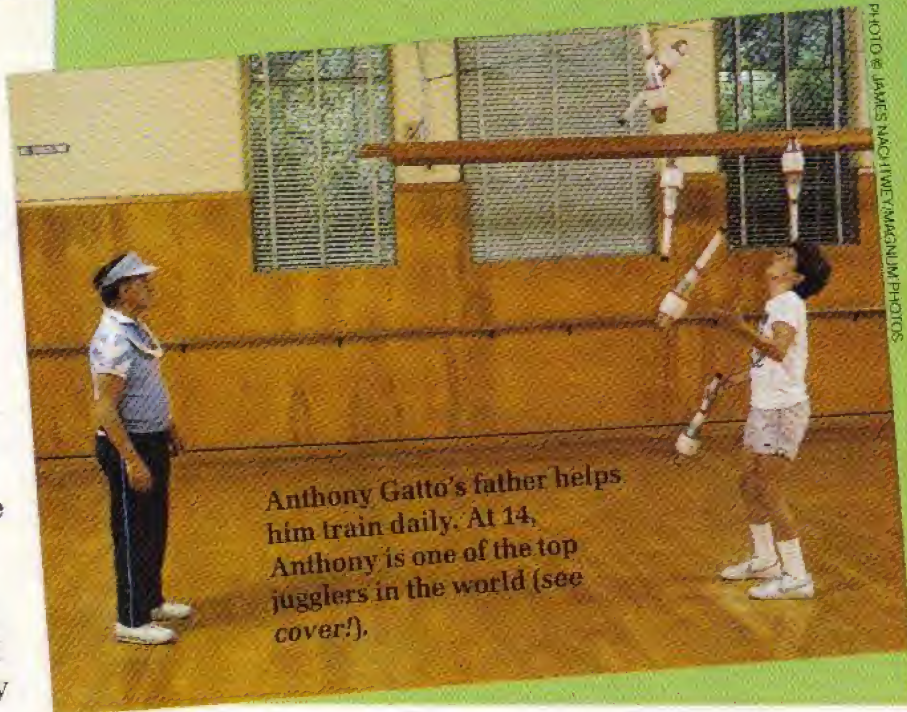
New York. At this year's first club meeting, tennis balls were flying everywhere. Sneakers squeaked as kids raced after the balls they dropped. Now and then—thunk!—a ball even hit the ceiling.

But Jeff Allen, 10, had three tennis balls going around in a seemingly endless loop.

"I learned from a kid in Seattle," Jeff told CONTACT. "But I didn't really get it until I came to class."

The club meets only once a week, so Danny and Pete tell their students to practice at home for at least 15 minutes every day. Even if you're just doing your "homework," throwing things at home can lead to trouble. "Once I was practicing at home and a ball hit a picture," admitted Jeff. "My mom got pretty upset. She made me juggle in the garage."

But kids aren't the only ones who've been catching the juggling bug. Dr. Steve Allen, Jr. teaches grown-ups to juggle for their health. Juggling seems to take people's minds off other problems, and helps them relax. According to Dr. Allen, juggling also helps adults relearn how to "laugh and be joyful."



Anthony Gatto's father helps him train daily. At 14, Anthony is one of the top jugglers in the world (see cover!).

That's Silly!

According to Dr. Allen, most adults get exercise from games like tennis—games people try to win. Since those games can make people tense, Dr. Allen thinks it's healthier to do silly exercises, such as juggling.

If it's healthy to laugh, it's healthy to watch jugglers in action. Especially when they bounce balls off their knees, roll them off their heads, and toss them under their legs! Or when they take bites out of apples while still juggling.

Gene Jones told CONTACT: "I like to juggle a ball, a tambourine, and a plastic chicken while playing 'Tea for Two' on a kazoo. Then I bang the tambourine off my head in time to the music."

As silly as that sounds, learning to do juggling tricks takes lots of practice. Albert Lucas, one of the world's top jugglers, spent four hours a day for five years learning to juggle on ice skates. "It was rough," Albert told CONTACT. "Skating rinks are cold!"

But thanks to all that practice, he was able to do tricks like this:

"Picture a man skating fast. He's all alone, balancing on one skate. On his right knee he's spinning a ring. On his right ankle, he's spinning another. In his mouth is a stick, one and a half feet long. And balanced on top of it is a mirrored ball. Then with his arms he's juggling nine rings.

"That's one of the hardest tricks I've ever pulled off," added Albert. "When I performed it in big arenas, I had to have them turn off the air conditioning. Otherwise the slight air currents would have thrown me off!" ➡

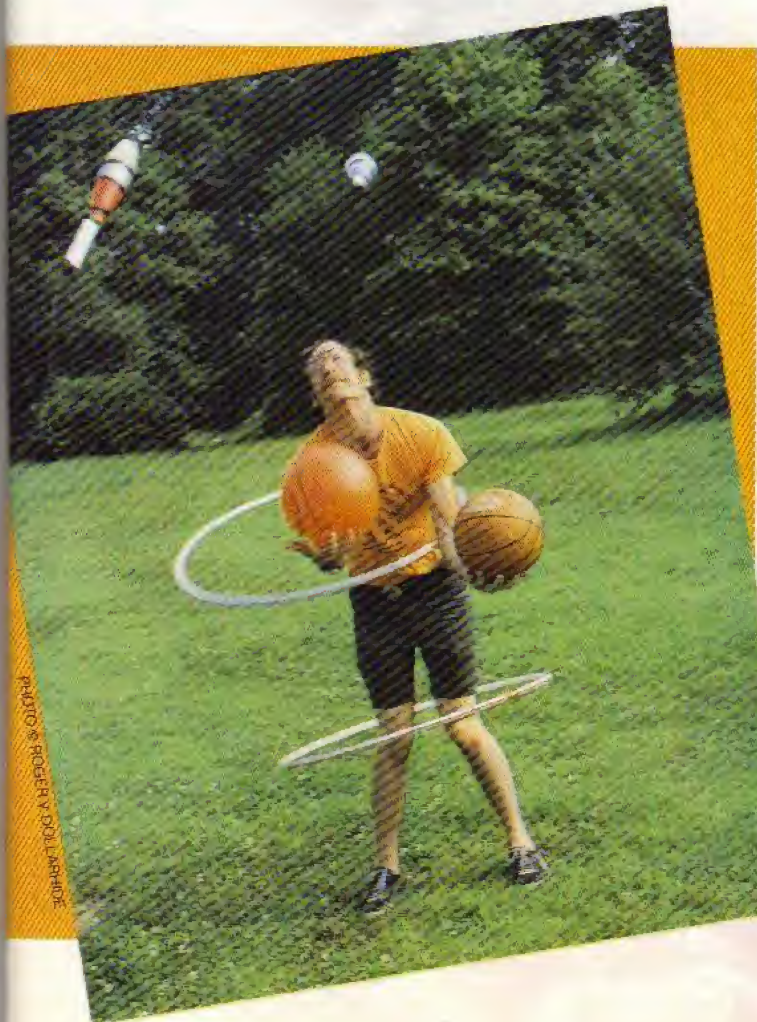


PHOTO © ROCKY DOLLAARD

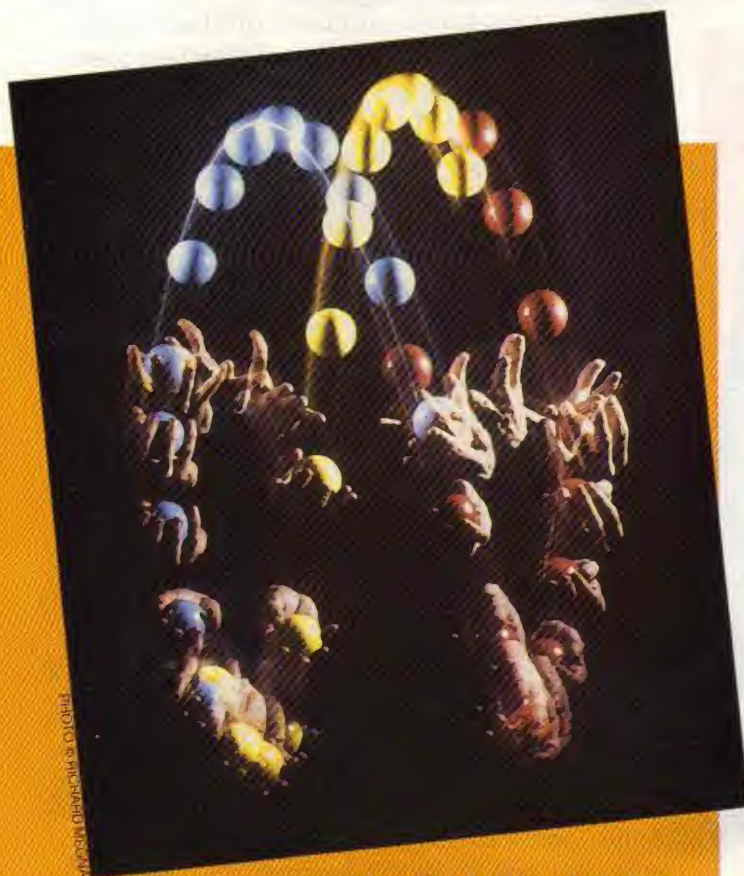
Record-Breaking!

Jugglers like Albert Lucas are always trying to set new records. In fact, Albert holds 11 of them. To make a record official, and to get in *The Guinness Book of World Records*, a juggler has to perform for a juggling judge. Right now, Gene Jones of the Jugglers Network in New York City judges all juggling records.

"People come from all over the country to juggle for me," said Gene. "One guy—Ashrita Furman—came into my office and started juggling while I was on the phone. He juggled for six hours without dropping a ball. That's a new record!"

That record doesn't impress Claude Shannon, though. He knows someone who can top that at just a flick of the switch. Mr. Shannon has designed a robot that juggles! "I once left it running all night," said Mr. Shannon, "and it never dropped a ball."

Mr. Shannon built the robot to look—and act—like W.C. Fields. W.C. Fields was a famous juggler who juggled his way into the movies. The W.C. Fields robot juggles metal balls over a drum. The balls bounce off the drum and back into the robot's wooden hands.



Juggling balls make pretty patterns that interest mathematicians.

It's the wrong way to ride a bike, but it's the right way for Edward Jackman to get oohs and ahs.



PHOTO: GARY W. SWIFT/IMAN

"It's really a simple machine," said Mr. Shannon. "But it has to throw the balls very accurately. It doesn't have any machinery that 'sees' the balls. Try juggling blind-folded. In a way, that's what my machine is doing!"

Juggling by the Numbers

Mr. Shannon's robot may be able to juggle the longest, but Albert Lucas can juggle the most. Today, he's the only juggler in the world who can juggle 14 rings. "Before I retire," said Albert, "I want to make it to 16!"

Is there a limit to how many objects people can juggle? Will a juggler someday learn to juggle, say, 100 rings? Dr. Peter Francis of San Diego State University in California says no.

Dr. Francis uses science to study how athletes perform amazing feats. "When you juggle more items, you need more time," explained Dr. Francis. "That means you have to throw the things higher."

Albert Lucas agreed: "When I juggle 14 rings, I have to throw the first ring about 50 feet up!"

The problem is, as objects fall, they speed up. "So even if you throw an object very high, you're not giving yourself a lot of extra time," said Dr. Francis.

Right:

Together, these 476 jugglers set a new record. They kept 1,867 objects up in the air at once!

Below: Albert Lucas crosses the finish line after "joggling" for 26.2 miles—without dropping a ball!

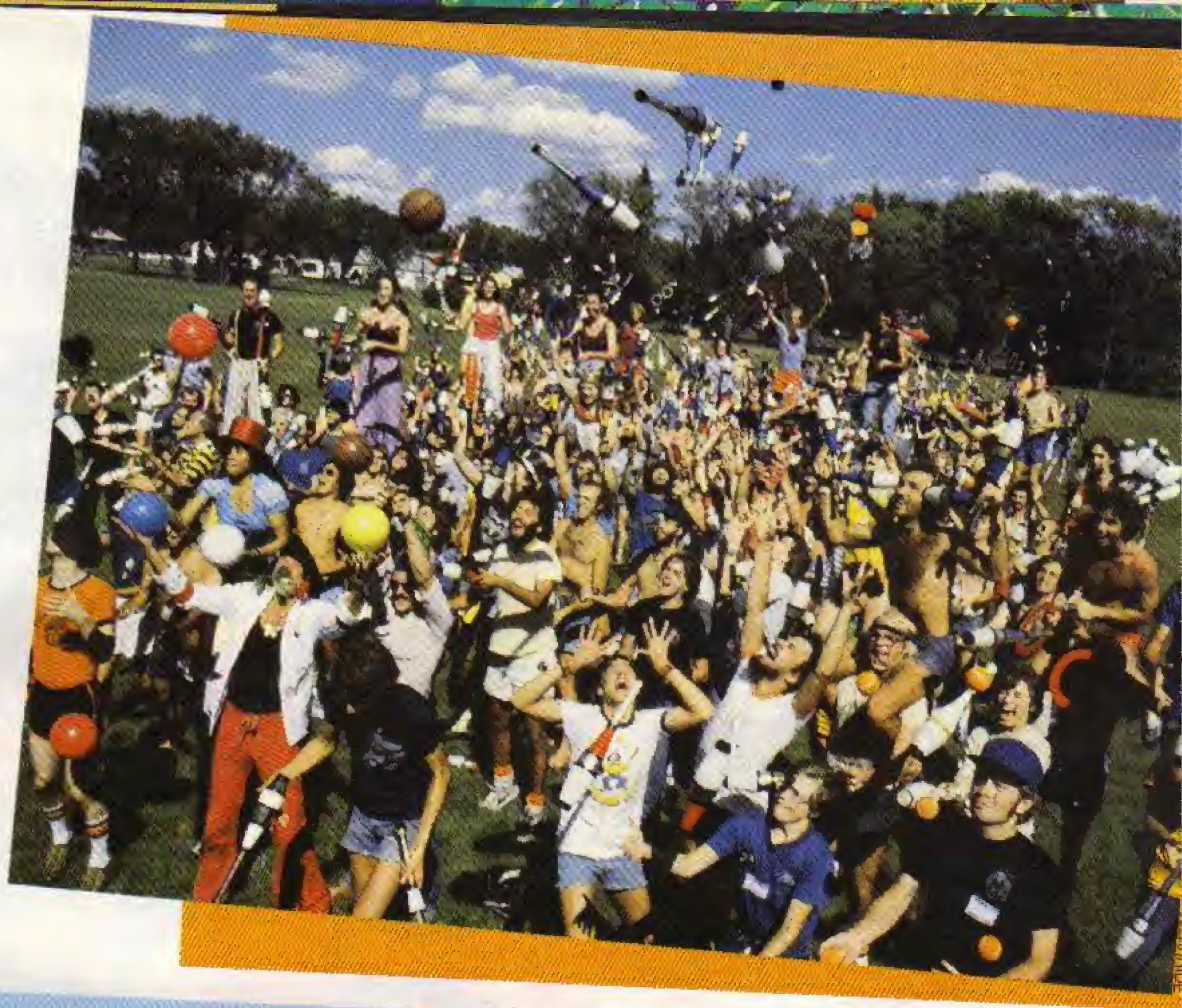


PHOTO: SCOTT MORRISON

Objects speed up as they fall because of the Earth's gravity. That's the force that holds you on the planet. If you were in outer space, far away from Earth, there would be no gravity. Out there, juggling balls would just drift.

"Astronauts have tried things like playing jacks in space," Albert Lucas said. "There's not much sport in that. You could take a nap in the middle of the game, wake up and still have time to catch the ball!"

But there is a place in space where Albert Lucas wants to juggle—the moon! The moon's gravity is one-sixth as strong as Earth's. On the moon, juggling balls would take a long time to come down.

"If I ever get to go to the moon," said Albert, "I'd stand there with a basket of balls and I'd throw the first ball straight up. Then I'd turn five inches to the right and throw up the next one. I'd just keep turning and throwing. Who knows how many I could do!" ➔

Juggling is not new. In fact, this painting on the wall of an Egyptian tomb shows that juggling is at least 3,000 years old!



COURTESY, JUGGLERS WORLD

HOW TO JUGGLE

Everyone can learn to juggle. But it takes hours of practice, so don't get discouraged! If you're practicing indoors, try rolled-up pairs of socks. Socks don't bounce!

Start by practicing with one sock-ball (Step 1). Juggling one item isn't as easy as you might think. On a good throw, you shouldn't have to move your other hand to make the catch.

Once you've mastered Step 1, practice Step 2 (with two sock-balls) until you can throw and catch both sock-balls easily. Eventually—if you stick with it—you'll be ready for Step 3, three sock-balls. And when you can handle three, you're juggling!

STEP 1



STEP 2



STEP 3



ILLUSTRATIONS BY JOYNNALCORN

Want more info? We recommend *Juggling for the Complete Klutz* by John Cassidy and B.C. Rimbeaux (Klutz Press, \$9.95). A "klutz" is someone who isn't very coordinated. Everyone feels like a klutz when they first start juggling!

Jeepers, Creatures

Where'd you get those features?

by P.C. Russell Ginns



PHOTO © MICHAEL HABICH/ANIMALS ANIMALS

Monkeys with huge noses...birds with helmets on their heads...fish with fringes or spikes on their bodies...If you searched from the bottom of the ocean to the jungles of Africa, you'd find these odd-looking animals. Although they may look funny to humans, the strange features help these animals to survive.

Take the giraffe, for example. You might think it's an odd-looking animal. But if you know that with its long neck it can reach branches and leaves that are out of reach of other animals, then it might not seem so weird after all.

The animals on these pages have adapted their bodies so they can live in their world. The changes haven't taken place overnight. In fact it has taken hundreds of thousands of years for these animals to look the way they do today.

Star-nosed Mole

Moles spend most of their time digging underground tunnels and hunting for worms to eat. Since there isn't very much light underground, you might think the mole would have excellent eyesight. Wrong! Their eyes can't do anything more than tell light from dark. Instead, star-nosed moles have an extra-sharp sense of touch. A special body part helps the mole find its way in the dark. It's a star-shaped piece of skin that has 22 different feelers. This makes worm hunting and tunnel digging much easier.

Turkey Vulture

You'll never see the turkey vulture on your Thanksgiving table. It may look something like a turkey, but it's a bird of a different feather altogether. Vultures are scavengers—they eat animals that are already dead. That's the reason for their unusual looking heads. When they eat, turkey vultures poke their heads around in dead bodies. The featherless heads keep germs from sticking. And that keeps the turkey vulture healthy.

PHOTO © PATTI MURRAY/ANIMALS ANIMALS



Hammerhead Shark

Scientists aren't sure why this dangerous animal has a head that's shaped like a hammer. It may help the shark to steer itself, like the rudder of a boat. Some people think that separated nostrils give the shark a better sense of smell. The hammerhead may use its head like a paddle. This would help it dive deep into the ocean. Few people want to study this mystery up close. That's because the hammerhead shark can be over 20 feet long—and very hungry. So watch out!

PHOTO: JOHN S. FLANNERY/BRUCE COLLEMAN INC.



PHOTO © M. AUSTERMAN/NATIONAL ANIMALS

Proboscis Monkey

Proboscis (Pro-BAHS-kiss) means nose. That's what gives this animal its name. Male proboscis monkeys can have noses up to seven inches long. But this doesn't give them a better sense of smell. It makes them louder. This monkey's nose works like a trumpet. Proboscis monkeys honk loud and clear to let other monkeys know that they have claimed a part of the forest. It's a way of saying, "This territory belongs to me."

Cassowary

This brightly colored bird can be found in the rain forest of Australia. But it doesn't do any flying there. In fact, it doesn't do any flying anywhere! The cassowary is a flightless bird. It runs through bushes and around trees. Since the cassowary can grow to be six feet tall, it can't always duck. That's the reason for the huge bony "helmet." It protects the bird from getting knocked on the head by branches.

PHOTO: M. AUSTERMAN/NATIONAL ANIMALS



Wobbegong

This dangerous fish is another member of the shark family. The wobbegong lies at the bottom of the ocean off the coast of Australia. Fringes around its sides provide camouflage so it can blend in with the rocks and coral. Fish that don't see it swim too close and get swallowed up. Luckily for humans, it lives very deep in the water.

PHOTO © CARL FOESSLE/ANIMALS ANIMALS



Spoonbill

This bird has long legs so it can wade around in marshes and rivers. It gets its name from its long flat bill that spreads out like a spoon at the end. When the spoonbill wants dinner, it just swings its beak through the water. Fish and bugs and other tasty things get scooped right up. Spoonbills in the United States are pink. In some countries in Europe, they can be black, white or yellow.

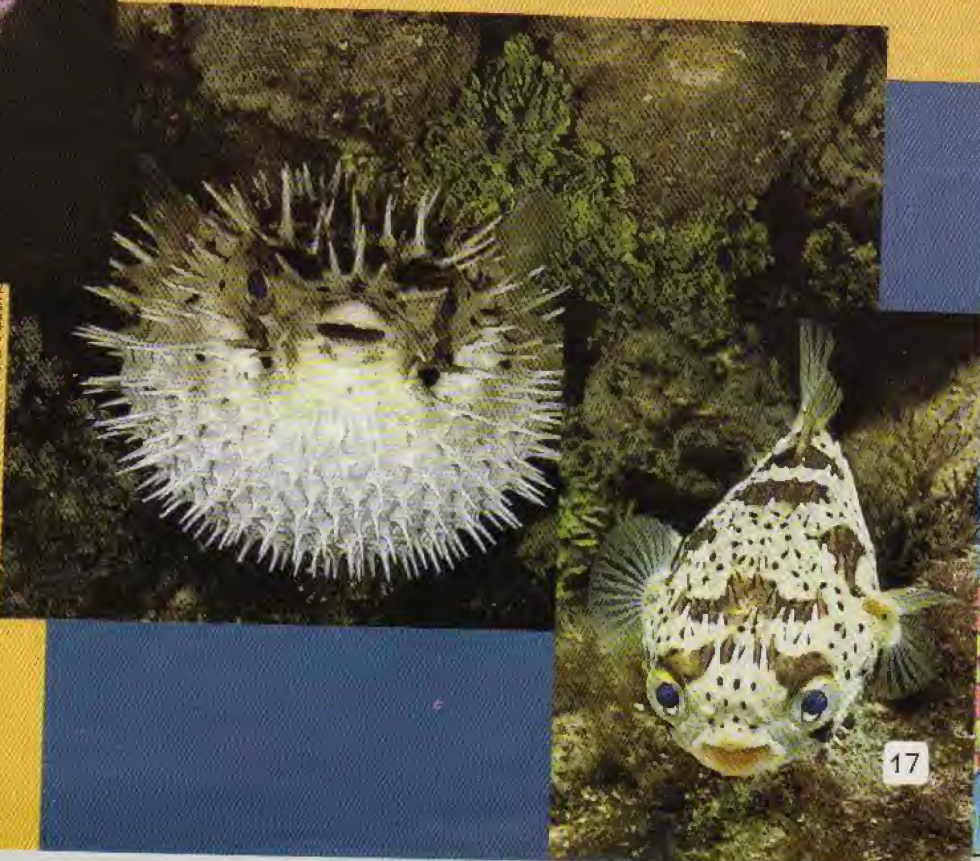
PHOTO © LYNN M. STONE/ANIMALS ANIMALS



Porcupine Fish

Most of the time, the porcupine fish looks like any other fish you might find in the water. But when it thinks that it's in danger, it blows itself up into a huge spikey ball—the size of a basketball! It does this by swallowing lots of water. This helps scare most enemies away. But if the enemies still didn't get the point, they would definitely find the porcupine fish hard to swallow.

PHOTO © JIG LESZCZYNSKI/ANIMALS ANIMALS



Bedtime Stories

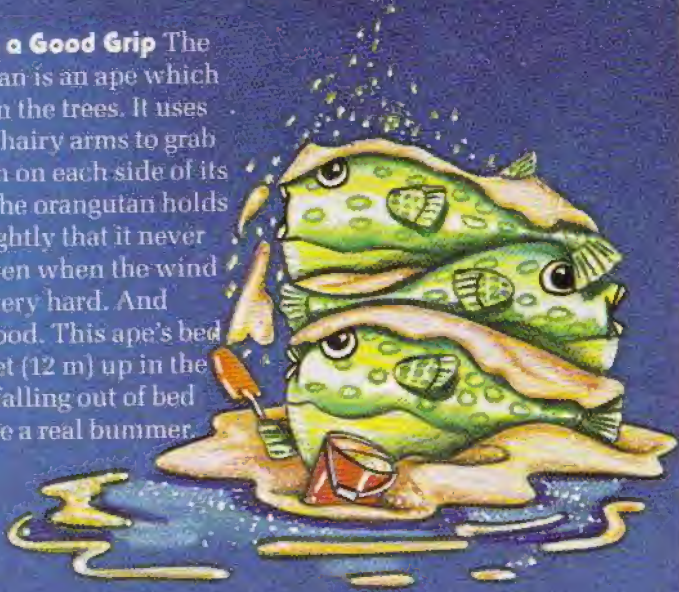
by Shaaron Cosner

Most people find a cozy place to curl up when they catch a few ZZZs. But when animals sack out, their sleeping places may be really wacky.

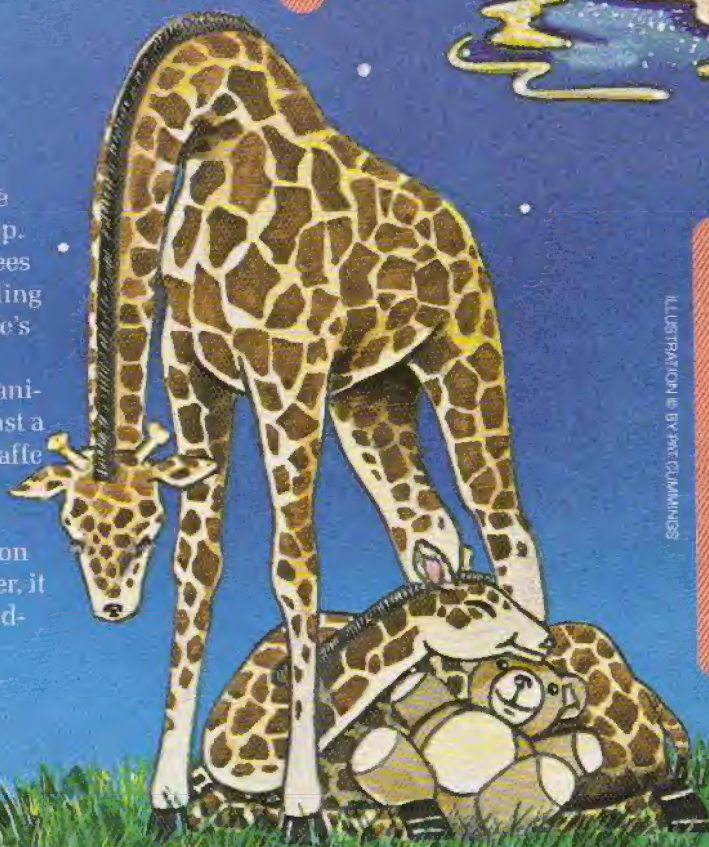


Getting a Good Grip The orangutan is an ape which sleeps in the trees. It uses its long hairy arms to grab a branch on each side of its body. The orangutan holds on so tightly that it never falls—even when the wind blows very hard. And that's good. This ape's bed is 40 feet (12 m) up in the air! So falling out of bed could be a real bummer.

Birds of a Feather Bobwhites sleep in a circle with their heads facing outward. Huddling together keeps the birds warm. These birds sleep very lightly. This way, one of the bobwhites will hear a fox if it tries to sneak up on them. When danger lurks, each bobwhite flies off in a different direction. When the fox goes away, they make a new circle and go back to sleep.

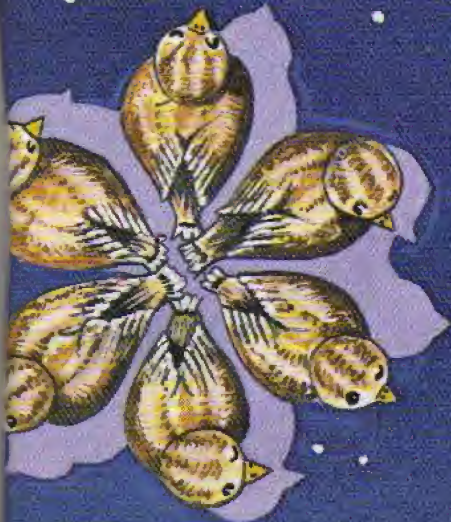


A Tall Snooze A giraffe often sleeps standing up. Special joints in its knees lock to keep it from falling over. Usually the giraffe's long neck just hangs down. Sometimes the animal rests its neck against a nearby tree. A baby giraffe snoozes lying down, however, with its neck twisted around to rest on its back. When it's older, it will learn to sleep standing up, too.



Second-Hand Beds The hermit crab doesn't mind using someone else's bed. This critter finds a sea snail shell to sleep in. The crab uses the shell every night until it can no longer fit. Then it finds a larger shell and starts all over again. Soon some younger hermit crab moves into the old shell. It's like musical shells instead of musical chairs.

ILLUSTRATION © BY PAT GUMMINGS



Pooped Puffers Puffers are fish that live in water but sleep on shore. They pile up, two or three deep, on the beach in shallow water. There, they use their fins to toss sand up over their backs. That's an effort to keep themselves warm. It's also a funny sight to see. Just imagine a big sandy stack of sleeping fish!

Turkey Trot Wild turkeys sleep in the same place each night, even if hunters are around. At bedtime, they break into a run to reach their roost in a tree. All the turkeys circle the tree as if they had never slept there before. Then, with much shoving, they settle on their perches. Is that why someone who acts silly is called a "real turkey"?



BuzzZZZ The bee works full time to make a winter supply of honey. Then it catches up on sleep for a few nights. Some bees sleep in clusters to keep warm. There may be up to 300 bees in one clump. When the hive gets too cool, the bees wake up and fan their wings together to warm up. A lot of wing beating can raise the temperature several degrees.

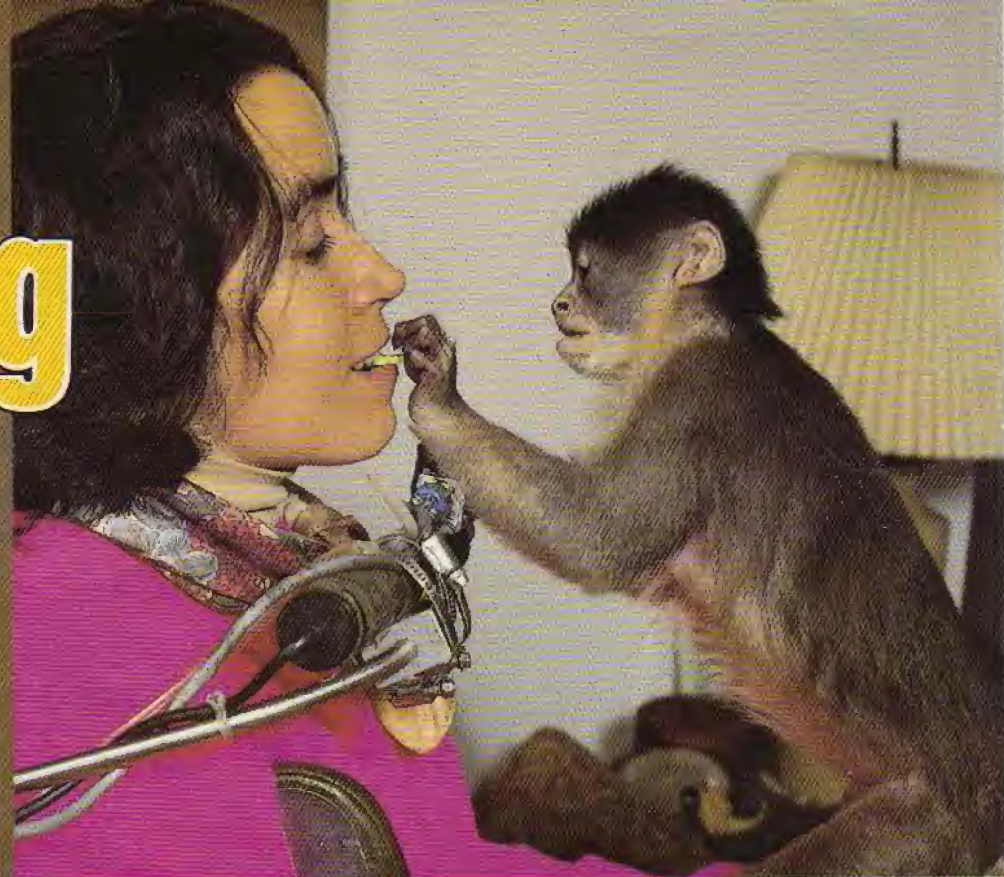
Water Deds The brown seal sinks to the bottom of the sea when it sleeps. It rests there about 20 minutes, holding its breath. Still asleep, it rises to the surface and takes several deep breaths. Then the seal sinks back down to the bottom. The whole nap is spent bobbing up and down like a yo-yo. You would think a brown seal would be very tired when it wakes up. But it's not!



Helping Hands

**MONKEYS
LEARN TO
CARE FOR THE
DISABLED**

by Deborah Heiligman Weiner



Miss Quincy drinks her bottle hanging upside down. Sam throws a "Pound Puppy" into the air and pounces on it as it lands. Miss Quincy and Sam are each a few months old and weigh just a few pounds. They are babies—monkey babies.

Sam and Miss Quincy are not only furry and cute, they are also very important. They are part of a project called "Helping Hands." When they are a little older, Miss Quincy and Sam will be trained to help people who are disabled. The monkeys will help people by being their arms and legs!

When Sam and Miss Quincy are about three years old, they will go to live with quadriplegics

(kwah-druh-PLÉE-jiks). A quadriplegic is someone who has lost the use of both arms and both legs, usually as a result of an accident. Most quadriplegics can move only their heads. They must depend on other people to feed them, brush their hair, or turn on a light.

Ten years ago, Dr. Mary Jane Willard was working with famous scientist B.F. Skinner, training animals in a laboratory. Dr. Willard had a friend who was a quadriplegic. She thought, wouldn't it be great if an animal could be trained to help make life easier for her friend. Dr. Willard thought of monkeys, because they are smart, and they can be trained to do many difficult jobs.

From that, Helping Hands was born. Helping Hands trains capuchin monkeys to help the disabled. Since most of the monkeys come from breeding farms, they have to learn to live indoors with people before they can go on to help quadriplegics.

So Helping Hands places each monkey with a foster family for three years. CONTACT talked to two foster families to find out what it's like to have a monkey hanging around the house.

Left: A small basket makes good transportation for two monkeys—Miss Quincy and friend!



PHOTO: KIMBERLY BUTLER

Left: Sue Strong depends on her capuchin monkey, Henrietta, and Henrietta depends on Sue.

Right: Stephanie and Cortney Smerdon join Merry Kazmar and Miss Quincy for a snack. "The neighborhood kids love Miss Quincy," says Mrs. Kazmar.

Below: Merry Kazmar teaches Miss Quincy how to help in the kitchen. In a few years, the monkey will be helping people who can't do things for themselves.



PHOTOS: KIMBERLY BUTLER

Sam and Quincy

"Sam is not a monkey. He's a part of our family," Janet Moyer, of Reading, PA, says. Her daughter, Yvonne, 12, agrees. "All of my friends want to come over and see him, but we have to say no. They get carried away and they could scare Sam. But Sam is really funny. Sometimes my mom's boyfriend acts like Frankenstein, and Sam tries to imitate him. So we call Sam, 'Samenstein!'"

The Moyers' main job, like all of the foster families, is to help Sam get used to living with people in a home setting. Sam sleeps in a cage in the living room. When he is awake, he has the run of the house. The Moyers take Sam everywhere—to the supermarket, to the shopping mall, and on camping trips. Foster families make sure their monkeys drink their formula, eat well, keep warm, and stay healthy.

"It's really hard having a baby monkey," says Merry Kazmar, of White House Junction, NJ. "It's just like having a newborn human baby! Miss Quincy cries in the middle of the night and I have to wake up and feed her. But when you pull back the blanket and get a look at that furry little face, your whole life changes."

Miss Quincy is like a human baby in another way, too. "Just like a little kid might have a favorite teddy bear, Miss Quincy has a stuffed gorilla to cuddle," Kazmar notes. "Miss Quincy and the gorilla are the same size and sometimes when she hugs her gorilla, you can't tell where one ends and the other begins!"

The Monkeys Are Trained

After three years, the monkeys are ready to leave their foster families. They are sent to the Boston University School of Medicine. There →



they are trained by Dr. Willard and her staff.

CONTACT asked Dr. Judy Zazula, the head trainer, what the monkeys are taught. "Each monkey is trained to perform jobs that any quadriplegic would need, such as turning on lights, getting food, pouring juice, or turning on the TV.

"Suppose you want to train a monkey to turn on a light switch," Dr. Zazula explained. "First you show him how to do it, because monkeys love to imitate. Then you tell him to turn it on. When he does something that is at all close, like hitting the wall next to the switch, you give him a reward. (The rewards are usually pieces of fruit, or a mini-marshmallow.)

"When he touches the switch plate, you reward him for that. Next time he might turn the switch on and then off, and so you give him another reward. Eventually he will do exactly what you tell him to—he will turn on the light. You reward him for that, and never reward him for doing anything less."

Since quadriplegics cannot move their limbs, they do everything with their mouths. To point, a quadriplegic holds a laser stick in his or her mouth and shines it on an object. So the monkeys are taught to respond to the red dot of light and a one-word command. When a quadriplegic wants to have a light turned on, he shines the laser on the switch and says "On." A trained monkey will know what to do.

Helping Hands To Work

After six months of training, Helping Hands matches the monkey with a quadriplegic. Then Dr. Zazula, or one of the other trainers, goes to



PHOTO © DONALD DIETZ

the quadriplegic's home and trains the monkey to perform the jobs his owner needs done.

For example, a monkey can learn how to put a diskette into a computer, open the mail, or scratch an itch.

The quadriplegic has a lot to learn, too. He or she has to learn to give commands and learn to be one step ahead of the monkey. "Monkeys are so smart, you have to learn how to be smarter than they are," Dr. Zazula says.

Having a monkey gives a quadriplegic freedom that would otherwise be impossible. Just ask Sue Strong of New York City. Strong was in a car accident in 1971. She hasn't been able to move anything below her neck since.

"Before I had my monkey Henrietta, if I was left alone it was like I was in jail," Strong says. "I needed people around all the time. And I could do only one thing, like read a book, or whatever the person set me up with before she left. If I dropped my mouth stick—which is what I use to turn pages, and do everything—I was sunk. I couldn't do anything but sit there until someone came back. Now Henrietta can pick up my mouth stick, or turn on the TV, put a cassette into my tape player, or give me food. It has made a huge difference for me."

Henrietta, and the other monkeys in the program, are not there just to help quadriplegics with physical jobs. They also give company and comfort to a person who might otherwise be lonely and unhappy. Some studies show that people are often uncomfortable around quadri-



Miss Quincy's toys include those that human babies use.

PHOTO: KIMBERLY BUTLER

Left: Monkeys get down to business at Helping Hands, where Judy Zazula teaches them useful skills, such as helping out with drinking tubes.

Right: Capuchin monkeys' hands are just right for tasks like putting a music tape in a cassette player and turning it on.

PHOTO © DONALD DIETZ



PHOTO © DONALD DIETZ

Left: For a quadriplegic, turning a magazine page can be very difficult—sometimes impossible—so the capuchins learn this too.

Below: Henrietta is a real help—and a real pal—for Sue Strong. Sue says Henrietta even helps her make friends when they are out on the street because the monkey's funny antics attract people.

plegics. But if a disabled person is outside with a monkey, people tend to come over to talk. This makes the disabled person feel good—and a part of the human race.

Henrietta seems happy with Sue Strong. The monkey seems to like riding in the car. "When we're in the car, Henrietta bangs on the windows to get the attention of people in other cars," Strong says. "She goes crazy if she sees kids. She puffs up her chest and acts ferocious. Of course the kids just think she's cute, and they laugh, which makes Henrietta act more ferocious. Cars are always slowing down to see this tiny monkey banging on the window. Henrietta really makes me laugh." ❧

PHOTO © RITA NANNINI



THE BLOODHOUND GANG

The Basketball Court Caper

By Becky Cheston



"**P**ee wee Blake," said Skip, reading the next name on the Bloodhound Gang's appointment book. "This ought to be a really—ahem—short interview!"

"Not necessarily," said Vikki. Skip and Ricardo looked up. Way up...at a very tall man.

"Now I remember!" said Ricardo. "You're Pee wee Blake—star center for the Sentinels!"

"But you shouldn't be here!" Skip exclaimed. "The final game of the big basketball tournament is tonight!"

The Sentinels were locked in a best-of-seven battle with the Royals. The series was tied 3-3.

"That's exactly why I'm here," said Pee wee.

"You need a talented young player to lead you to victory tonight!" said Ricardo, tossing a wadded-up piece of paper at a barrel across the room. It bounced off the rim.

"I'm afraid what the Sentinels need right now are detectives," replied Pee wee.

While Pee wee Blake drove the Bloodhound Gang to Sentinel Arena he explained that something mysterious had been happening.

The first four games of the tournament had been played at Royal Stadium. The Sentinels had taken the first two, the Royals had won the third, and the Sentinels had won the fourth.

Then the series had moved to Sentinel Arena. Here, the Royals had won both the fifth and sixth games. And, Pee wee explained, the Royals had not played those games fair and square.

"When the game would get close, we'd call a timeout and set up the next play," he said.

"You mean—you'd decide which player the team would count on to make the basket," said Ricardo.

"Right," replied Pee wee. "And as soon as we got back on the court, the Royals would hound that player and keep him from scoring."

Skip's voice echoed past rows of empty bleachers: "They're stealing your plays!"

Sentinel Arena had been the scene of many games over the years. The floorboards were worn, the walls needed a paint job, and the scoreboard was the ancient type studded with bare lightbulbs.

All Locked Up

By the time they reached the locker room, Ricardo was wide-eyed. All the Sentinel greats were there, including Joshua Scruggins, star forward, who was drinking juice, and Michael Frye, guard, who was reading a computer magazine.

"It's a good thing I got to meet you this season," said Ricardo, shaking Frye's hand. "Aren't you being traded next year?"

Just then there was a scuffle at the door. "Hey, you guys!" Skip called out. "Want to give me a hand? I found this Royals player sneaking around."

"Hold on a minute!" shouted Joshua Scruggins. "He wasn't trying to sneak in. I invited him in. Meet Henry Scruggins. My brother."

About half-an-hour later, Joshua stood by while the Bloodhound Gang conducted a search of the Royals locker room. A snoop around the court had turned up no leads. Vikki, Skip and Ricardo had even poked around for hidden microphones placed near the Sentinels' bench.

At first glance, the Royals' locker room didn't appear to hold any clues, either. In addition to the usual sports magazines, the sleuths spotted a parents' handbook, and a computer manual.

No one suspicious was on the court before the public was admitted to the arena. The only people the Bloodhound Gang could spot were the scoreboard technician chatting with Michael Frye and one of the Royals players named Wilson. In another corner the two Scruggins brothers played chess. With the game almost ready to start, the Bloodhound Gang took their seats courtside.

"Wow!" yelled Ricardo. "Did you see that?!"

Vikki had to admit it was a beauty: Peewee Blake swerved around three Royals players to get to the basket, then faked an underhand shot, and scored with a smooth slam dunk that ended the second quarter. But the spectacular shot only

put the Sentinels ahead by two points.

"Gee," said Skip, fanning himself with his program. "The air conditioning in this old stadium isn't very good." And adding insult to injury, the scoreboard was an eyesore. In addition to the sickly-looking lights that told the halftime score, a line of eight bulbs blinked at random.

By the middle of the fourth quarter, the Sentinels were down by two points. The air in the stadium grew hotter. Peewee called a timeout and the team huddled. Thirty seconds later they ran back onto the court.

The crowd fidgeted. The old floorboards creaked. The old scoreboard lights flashed.

And the Sentinels, one of their key players surrounded by Royals members, couldn't score.

Vikki Gets the Signal

All of a sudden, Vikki signaled for Peewee to stop the action.

"On that last play—who was supposed to take the shot?" she whispered. "Was it number 35?"

"Yeah—Josh Scruggins," said Peewee. "How did you know?"

"I found out the same way someone on the Royals is finding out," said Vikki. "Computer code."

"You must be joking!" said Peewee. "This old place doesn't even have a computer!"

"What I mean," said Vikki, "is that someone on your team is using computer language to pass information to the other team."

"I'm not following you," said Peewee.

"The binary code!" Skip said. "It's based on the pulses of electricity that flow through the computer's electronic circuits. It's written as a series of 1s and 0s. A 1 represents a pulse of electricity. A 0 represents the absence of a pulse."

"But what does all this have to do with our plays being stolen?" asked the coach.

"Well," said Vikki, "each pulse or no-pulse is called a binary digit—or 'bit'—for short. Most computers use combinations of eight bits—called a 'byte'—to represent numbers and letters."

"That odd row of bulbs on the scoreboard!" shouted Ricardo. "There are eight of them!"

Peewee turned to look at the scoreboard. ➡





"But only three of those bulbs are on now," he said. "How do you get number 35 out of that?"

"I'll show you," said Vikki, taking out a pen and notepad. "For each lightbulb that's turned on I'll put a 1, and for each that's turned off, I'll draw a 0." Vikki scribbled on the notepad. Her drawing looked like this:

0 0 1 0 0 0 1 1

"Now," she said, "here's how you translate the binary code into our decimal system of numbers. Each column—or lightbulb—in the binary system contains twice the value of the column on its right. So, for example, if you put a 1 in each column, the decimal values would look like this:"

128 64 32 16 8 4 2 1

"I think I can translate what's up on that scoreboard now!" said Peewee. "There's zero 128s, zero 64s, one 32, zero 16s, zero 8s, zero 4s, one 2 and one 1. Add it all together and you get 35!"

"Amazing!" said the coach. "But how do we stop whoever's doing this?"

"I have an idea," said Vikki.

The Mystery Byte

The game was still close, and the Sentinels were using up their last timeout. As they broke up the huddle and ran back onto the court, the row of eight bulbs on the scoreboard blinked on. Using Vikki's notepad, Skip drew a chart for each bulb that was on:

128	64	32	16	8	4	2	1
0	0	1	0	1	1	0	1

"Vikki!" he whispered. "I figured out who's trying for the next Sentinels' basket!"

STOP!!! Using binary code, can you calculate the jersey number of the Sentinels basketball player?

Just then, a roar went up from the crowd. "Peewee hit a three-pointer!" Ricardo yelled.

"But he's number 66," said Skip. "According to my calculations, the guy shooting the basket should have been number 45."

"You're right," said Vikki. "The plan was to tell the team to go for number 45. But since we knew that the information would be passed along to the Royals, Peewee held onto the ball himself while the Royals surrounded number 45!"

"You seem confused," said Ricardo to Michael Frye, the Sentinel guard. "Looking for this?" He held up Frye's computer magazine.

"Want to explain why, after the huddle, you took a detour past the scoreboard on your way out to the court?" asked Peewee.

"We know all about your play-stealing operation," said the coach.

"The scorekeeper was in on it, too," said Vikki. "And Tom Wilson of the Royals translated the signals. We found this computer manual in his locker."

"Gee," said Peewee. "Mike shouldn't have been so bitter about being traded. Now, he'll never play again. And the others will lose their jobs too."

"So," said Ricardo to Peewee. "I guess you're going to be looking for an extra player."

"Yeah," joked Skip. "Instead of paying Ricardo for his crime-fighting services, why not put him on the team for, say, 50 cents a game?"

"Now that," said Peewee, "is what I call a cheap shot!"

Watch for next month's Bloodhound Gang mystery!



Special Section

Television

TUNE IN TO SQUARE ONE TV ON YOUR LOCAL PBS STATION



Find The Mystery Number

Watch this juggler's cube as it spins in the air. As the cube turns, you can see different sides. BY LOOKING AT THE

DIFFERENT VIEWS, CAN YOU FIGURE OUT WHAT NUMBER APPEARS ON THE SIDE OPPOSITE THE NUMBER 5?

(Answer on page 34)

We set some new words to two popular songs. Try singing them.

The SQUARE ONE

by P.C. Russell Ginns

SOLVE THESE

Serial Girl

(To the tune of "Material Girl," sung by Madonna)

I have jump ropes, roller skates, kites,
Hula hoops and dolls,
Baseball cards, and rubber duckies,
Skateboards and footballs.

I used to find it difficult
To put my toys away.
It took so long to sort them,
I'd have no time left to play.

So I am listing all my material goods,
And I guess I'm a Serial Girl.
I'm putting numbers on my material goods,
And I am just a Serial Girl.

I used numbers and some letters
To organize this mess.
I have a dozen comic books—
I call them 12-C-S.

My hula hoop is 1 = A = P,
My skateboard is 1-D,
My roller skates are 2-R-S,
My jump rope: 1-P-E.

Yes I am listing all my material goods,
And I guess I'm a Serial Girl.
Yes, I am listing all my material goods,
And I am just a Serial Girl.

I have a pet tarantula,
I call him "Spot" (1-A).
I take him from his cage (1-E)
When we go out to play.

I got a beach ball for my birthday
Seven days ago.
Soon it will have a listing
And then everyone will know:

That it is one of my material goods,
'Cause I am just a Serial Girl.
Yes, I have listed all my material goods,
And I am just a Serial Girl!

**Riddle: What will she call
her beach ball?**

Hint: Check out the letters in dark type in the song.

ILLUSTRATIONS BY RENEE GHETTIER-STREET

TV SONGBOOK

MUSICAL RIDDLES

See if you can solve the riddle at the end of each song. Answers on page 34.

The Longest Line

(To the tune of "The Longest Time," by Billy Joel)

I went out to buy some groceries:
Three tomatoes and a piece of cheese.
But where should I go?
I'd like to be home soon so:
I need to know which is the longest line.

One line had four shopping carts to go.
Each one held twelve bags of marshmallows.
Now was I wrong, or—
Was that line a little longer?
Oh I don't want to choose the longest line!

One line said: "TEN ITEMS OR LESS."
I said to myself:
"That's better, I guess."
But thirty carts ahead of me in line
Were taking too much time
And I chose another.

Five carts stood before me at the gate.
In a magazine I read: "LOSE WEIGHT."
But I won't try it,
That's 'cause I won't need to diet—
If I don't make it through the longest line!

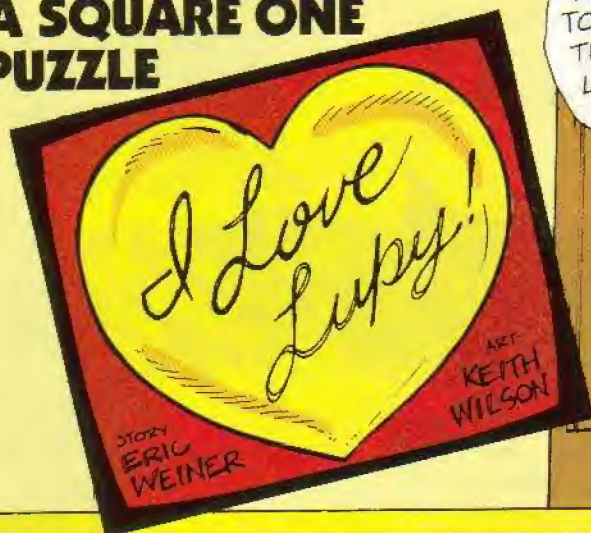
All five carts held four bags of rice.
I said to myself:
"You better think twice,
You'll never reach the register in time."
I tried another line
And hoped it was shorter.

Now there's just one man ahead of me.
Wonder how much longer it will be?
His cart has only
Sixty bags of macaroni.
I hope I didn't choose the longest line!

Riddle: Which line should he choose?

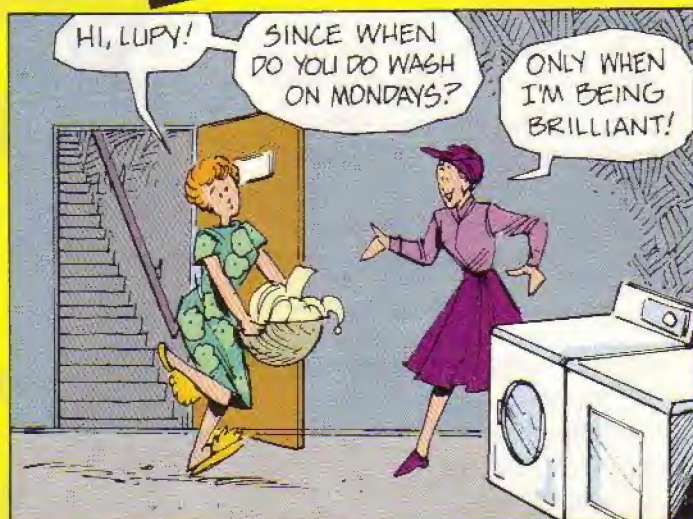
**Hint: How many carts are in each line? How many items in each cart?
Multiply carts by items and you'll breeze through the line!**

A SQUARE ONE PUZZLE



NOW DON'T FORGET
TO TAKE MY SUIT TO
THE CLEANERS,
LUPY. HERE'S
TEN DOLLARS.

YES, HONEY.
HAVE A GOOD
DAY!



HI, LUPY!

SINCE WHEN
DO YOU DO WASH
ON MONDAYS?

ONLY WHEN
I'M BEING
BRILLIANT!



LUPY, IS THIS ONE OF
YOUR CRAZY IDEAS?

YOU BET,
GRETEL!

DIZZY WOULDN'T
GIVE LITTLE
DIZZY TEN
DOLLARS FOR
A TOY DRUM.



BUT HE GAVE ME TEN
DOLLARS TO GET HIS
FAVORITE SUIT CLEANED.

I'M DOING
THE CLEANING
MYSELF--
AND I'LL USE
THE TEN
DOLLARS TO
BUY THE DRUM.



BUT LUPY!
YOU DIDN'T
PUT THE SUIT
IN THE DRYER,
DID YOU? IT'LL
SHRINK!

UH,
OH...

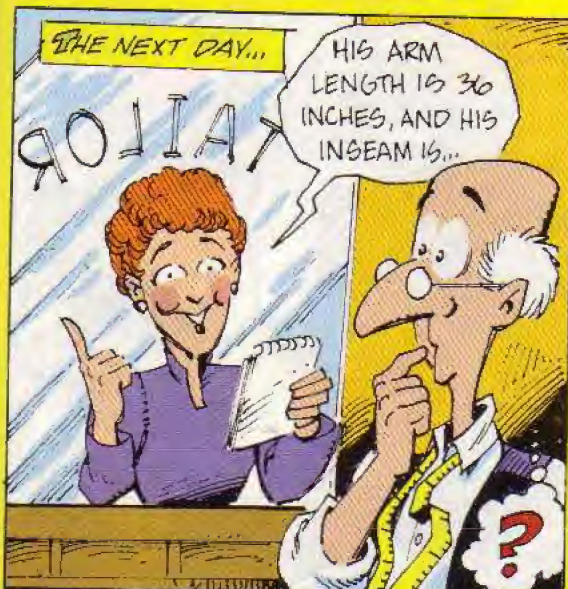


WAAAAH!

YOU'RE REALLY
GOING TO GET IT
NOW, LUPY. SAY, WHAT'S
THIS?

A MEASURING
TAPE. Hmmm... I
JUST HAD ANOTHER
BRILLIANT IDEA!





WHAT LUPY DOESN'T KNOW IS, THE THREE-FOOT MEASURING TAPE ALSO SHRANK-- TO TWO FEET! SO WHEN THE TAILOR MAKES THE SUIT, WILL IT BE TOO BIG OR TOO SMALL? CAN YOU HELP LUPY BY FIGURING OUT WHAT THE REAL MEASUREMENT SHOULD BE?



IF YOU'RE STUMPED, TURN THIS PAGE UPSIDE DOWN!

ANSWER: LUPY MEASURES DIZZY'S ARM AS 36 INCHES -- 3 FEET LONG. THAT'S THE WHOLE MEASURING TAPE, BUT THE MEASURING TAPE SHRANK FROM 3 FEET TO 2 FEET. SO DIZZY'S ARM IS REALLY ONLY 2 FEET LONG. DIZZY'S SUIT WILL BE WAY TOO BIG!

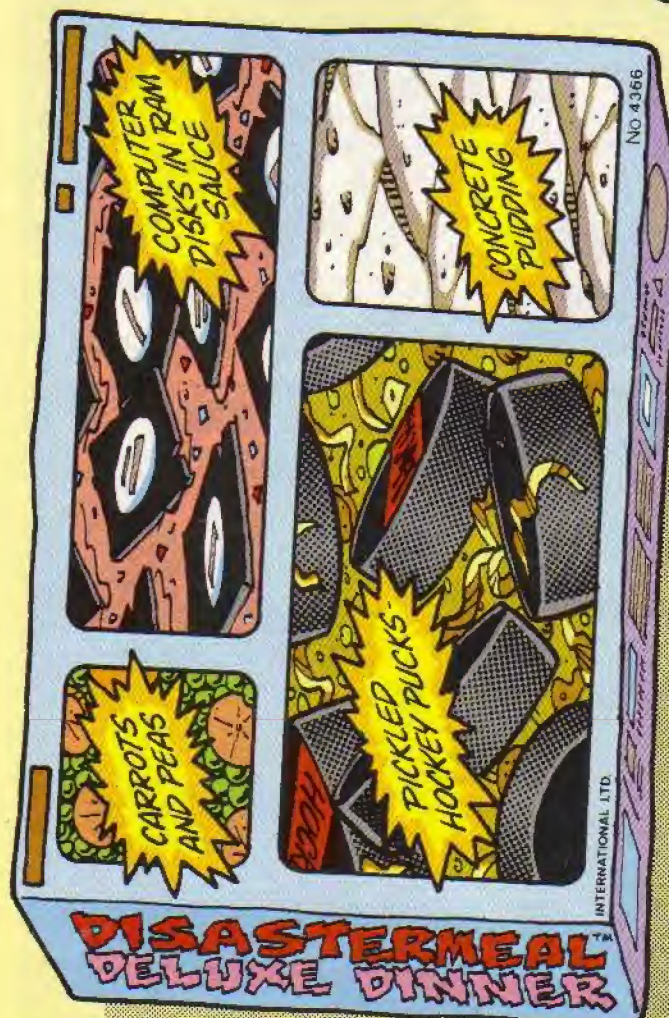
WUK!

There are gobs of gross stuff in our Square One TV dinners.

• WHICH ONE HAS THE MOST REAL FOOD?

• HINT: Use a ruler to measure the length and width of each food compartment.

• For the answer, turn to page 34.





BLACKSTONES

Magic Page

CAN YOU READ MY MIND?

With this month's Blackstone card trick, you can!

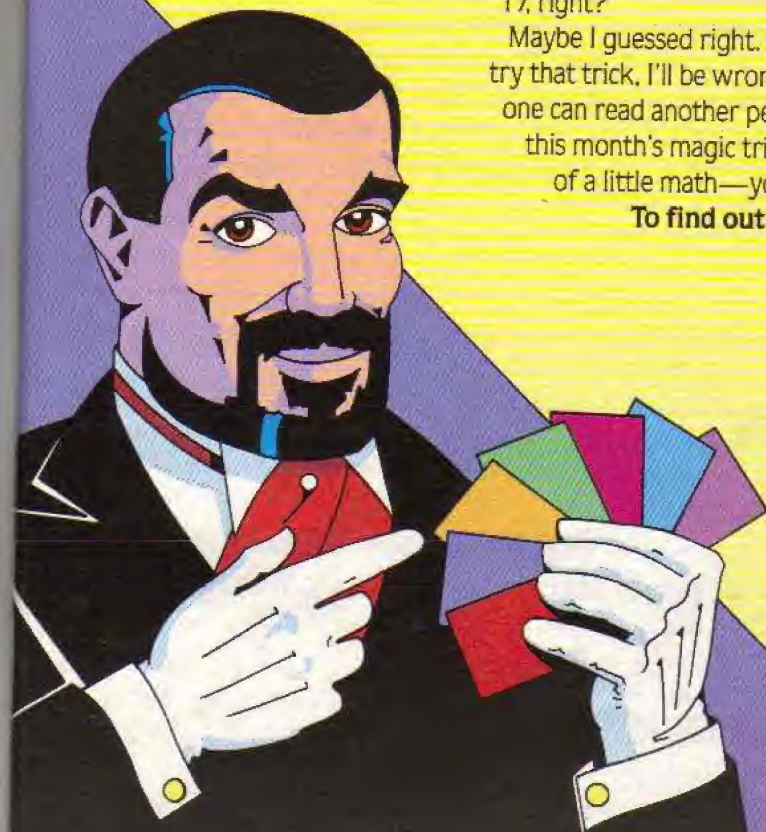
Pick a number, any number.
Think about it hard.

Okay, now I'm going to read your mind! The number
you're thinking of is...

17, right?

Maybe I guessed right. But almost every time I
try that trick, I'll be wrong. That's because no
one can read another person's mind. But with
this month's magic trick—and with the help
of a little math—you can!

To find out how, turn the page.



2 3 6 7 10 11 14 15
18 19 22 23 26 27 30 31
34 35 38 39 42 43 46 47
50 51 54 55 58 59 62 63



4 5 6 7 12 13 14 15
20 21 22 23 28 29 30 31
36 37 38 39 44 45 46 47
52 53 54 55 60 61 62 63



1 3 5 7 9 11 13 15
17 19 21 23 25 27 29 31
33 35 37 39 41 43 45 47
49 51 53 55 57 59 61 63

16 17 18 19 20 21 22 23
24 25 26 27 28 29 30 31
48 49 50 51 52 53 54 55
56 57 58 59 60 61 62 63



8 9 10 11 12 13 14 15
24 25 26 27 28 29 30 31
40 41 42 43 44 45 47 56
57 58 59 60 61 62 63



32 33 34 35 36 37 38 39
40 41 42 43 44 45 46 47
48 49 50 51 52 53 54 55
56 57 58 59 60 61 62 63



BLACKSTONE'S

Magic Page



HOW TO DO THE TRICK:

1. Cut out—or copy—all six cards.
2. Memorize the smallest number on each card. Each card has a different color back. You have to learn which smallest number goes with which color! (For instance, when you see the yellow card, you have to be able to say to yourself: "Aha! The smallest number on that card is 16!")
3. Now have someone pick a card, any card. Tell them to silently pick a number on the card. Since you can see the color of the card, you know its smallest number. Remember it!
4. Now have them look at each of the other cards and tell you which cards their number appears on. Keep a run-

ning total in your head. Whenever they find a card with their number, add the card's **smallest** number to the smallest number from the first card.

Those numbers will add up to—the number they picked!

HOW IT WORKS

This trick uses a version of the binary code. That's the same code used to program computers.

For more info on the binary code, see this month's Bloodhound Gang!

ILLUSTRATION BY BILL SLOAN

ANSWERS: SQUARE ONE

Songbook:

"Serial Girl" 1-H-L. She coded the things by the number of the items she had, and by the last letter of the item.

"The Longest Line" The shortest line is the one with five carts with four bags of rice in each. That's 20 items in all.

Find the Mystery Number

The number opposite the five is eight.

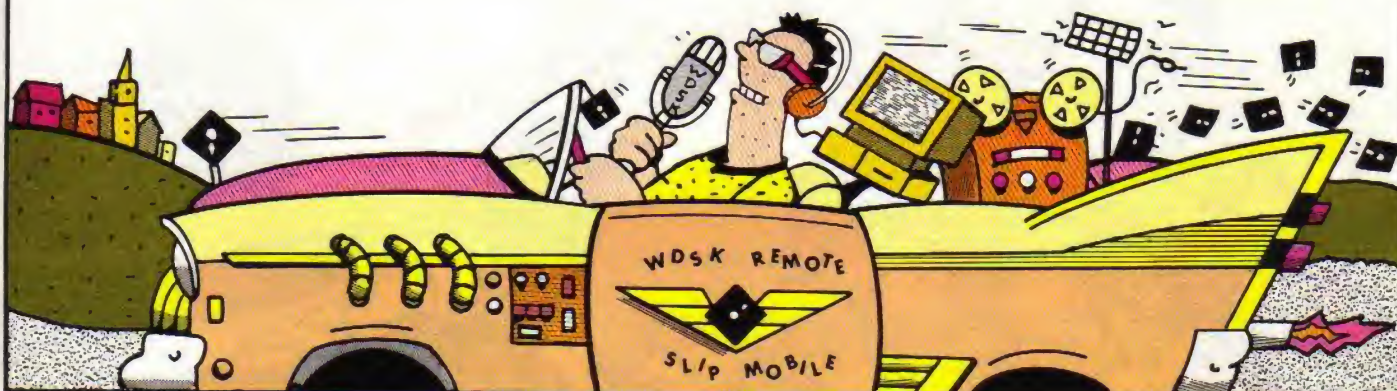
Yuk!

The Garbage Gobbler TV dinner has the most real food.

The Slipped Disk Show

COMPUTER

QUESTIONS AND ANSWERS



Hi, there, all you cool computer kiddies! This is Slipped Disk, world-famous floppy disk jockey and computer expert, coming at you with another edition of the Slipped Disk Show, the computer advice column that dares to ask the musical question: "When April showers come your way, aren't you glad you're not driving a convertible?"

And speaking of convertibles, since it is April, I decided to take the old Slipmobile out for a spin and see if I could spot any citizens in desperate need of computer advice. Here's a question we chewed over for a while. It's from **Brittany Walker**, of Lakewood, Ohio. Brittany asks:

"In our computer class we've been using LOGO. What exactly is LOGO? Who invented it?"

Brittany, don't snap at us for being slow. Floppy and I promise to shell out an answer. If you're learning LOGO, then it's time to talk turtles. No, I don't mean the kind that lives in lakes and swamps. I mean the turtle that you find in the LOGO programming language.

LOGO is a programming language that was designed to be used by

young people. It was developed about 20 years ago by a professor named Seymour Papert.

In LOGO, the turtle is the name of the graphics cursor. With LOGO commands, you can draw pictures by moving the turtle around your video screen. For example, the LOGO command FD 2 moves the turtle forward two spaces. RT 90 makes the turtle turn 90 degrees.

By the way, Brittany, LOGO comes from the Greek logos, which means "word" or "thought." At least, that's what our teacher tortoise!

Speaking of shells, I think I better raise the old roof on the Slipmobile. It looks like one of those April showers is coming our way.

Well, it doesn't matter how this next question got here. It's from **Andy Svendsen**, 13, who writes to us all the way from the city of Accra in the country of Ghana. (That's in Africa.) Andy wants to know:

"How does the joystick tell the computer what to do?"

Andy, the joystick sends the computer electronic messages through it's cable. You might think, when you're playing a game of *Crazed Mutant Vegetables From The Planet*

Beyond The Edge Of Everything, that the joystick sends messages like, "Hey! Watch out for that crazy radioactive zucchini!" But actually, the joystick messages are in a simple code.

You may be imagining that your joystick is the control for a warp-speed spaceship, but it really is a pointer that can only point in eight directions. You can think of the directions as the points of a compass: N, S, E, W, NE, SE, SW, NW. So the joystick has to send only eight different signals to tell the computer where to move your video spaceship, or your football player, or your cursor. The signals are in the form of numbers and they are different for each computer. There is also a separate signal that tells the computer when you press the joystick button.

Remember to send your computer questions to:

**The Slipped Disk Show
3-2-1 CONTACT Magazine
1 Lincoln Plaza
New York, NY 10023**

See ya next month, and watch out for those raining violets!

The Slipped Disk Show is taped in front of a prerecorded audience.

ILLUSTRATION BY CAMERON EAGLE

Basic Training



Invent-O-Matic

Apple II, Commodore 64/128, IBM

Did you ever get the itch to invent something really useful, like a new kind of mousetrap? (Or how about a back-scratcher for that itch?) This program will help you invent some weird and wonderful gadgets to solve just about any problem you can think of. We won't promise you the inventions will work, exactly, but you'll have fun thinking them up.

You start with the 20 items listed on the next page. Each time you run *Invent-O-Matic*, it selects six items for you to work with and tells you the type of invention you should create. The program lets you add one more item. You can either pick something from *Invent-O-Matic's* inventory, or add something else you think will be useful.

Now you start inventing. How can you put the items together to accomplish the task? Try to connect them so you get a chain reaction, with one thing leading to another. Choose one item at a time from the list, and type in an instruction for how it should be used. You must use all seven items. We've invented a special kind of luggage-packer to give you the idea.

You can change the items in your inventory by changing the DATA statements in lines 460-500. You can change the types of inventions by changing the items in line 510. Be careful not to change the number of items in any statement, and don't forget your commas!

Below is the program for Apple II series computers. Following that are instructions for adapting the program for other machines.

Apple II

```

10 REM INVENTOMATIC
20 DIM
   PART$(6,7),INVENT$(5),PT$(7),
   IS$(7)
30 GS = 1:GOSUB 520
40 FOR X = 1 TO 5
50 READ I$:INVENT$(X) = I$
60 NEXT X
70 HOME:PRINT "INVENTO-
   MATIC INVENTORY"

```

```

80 GS = 3:GOSUB 520
90 PRINT
100 PRINT "WHEN READY TO
   PROCEED, PRESS RETURN"
110 INPUT G$
120 HOME
130 PRINT:PRINT
   "HELLO,INVENTOR"
140 PRINT "YOU HAVE BEEN
   REQUESTED TO INVENT"
150 I = INT ( RND (1) * 5) + 1
160 PRINT INVENT$(I)
170 PRINT "HERE ARE THE
   AVAILABLE PARTS:"
180 I = 0:PRINT:PRINT
190 GS = 2:GOSUB 520
200 PRINT:PRINT
210 PRINT "YOU MAY ADD ONE
   PART"
220 PRINT "CHOOSE FROM
   INVENTORY, OR MAKE UP
   YOUR OWN."
230 PRINT "INPUT NEW PART."
240 INPUT PT$(I + 1)
250 PRINT "WHEN READY TO
   PROCEED, PRESS RETURN"
260 INPUT G$
270 HOME:INPUT "WHAT IS THE
   NAME OF YOUR
   INVENTION? ";N$
280 REM INSTRUCTION LOOP
290 FOR X = 1 TO 7
300 HOME
310 PRINT "AVAILABLE PARTS:"
320 FOR Y = 1 TO 7
330 PRINT Y,") ";PT$(Y):NEXT Y
340 PRINT "ENTER NUMBER OF
   PART YOU WISH TO USE."
350 INPUT PN:PT$(PN) = ""
360 PRINT "ENTER
   INSTRUCTION FOR THAT
   PART"
370 PRINT "(LESS THAN 40
   CHARACTERS)"

```




ILLUSTRATIONS BY MARTIN LEMELMAN

LIST

50 lb. Weight
Trapdoor
Spring
Rope and Pulley
Thumb Tack
Seesaw
Treadmill
Cat
Chicken
Goat
Hamster
Balloon
Parachute
Umbrella
Watering Can
Frying Pan
Electric Fan
Alarm Clock
Ice
Candle

```
380 INPUT ISS$(X)
390 NEXT X
400 HOME:PRINT
    "INSTRUCTIONS FOR
    BUILDING A ";N$
410 PRINT:FOR X = 1 TO 7
420 PRINT ISS$(X):NEXT X
430 PRINT:PRINT "WOULD YOU
    LIKE TO INVENT
    SOMETHING ELSE?
    Y/N"
440 INPUT G$:IF G$ = "Y" THEN
    120
450 END
460 DATA 50 LB WEIGHT,
    TRAPDOOR, SPRING, ROPE
    AND PULLEY, THUMB TACK,
    SEESAW, TREADMILL
470 DATA CAT,CHICKEN,
    HAMSTER, GOAT
480 DATA BALLOON,
    PARACHUTE, UMBRELLA
490 DATA WATERING CAN,
    FRYING PAN, FAN
500 DATA ALARM CLOCK, ICE,
    CANDLE
510 DATA A MOUSETRAP, A
    DOGWALKER, SOMETHING
    TO GET YOU UP IN THE
    MORNING, A SUITCASE
    PACKER, YOUR OWN
    INVENTION
```

```
520 REM LISTING ROUTINES
530 FOR X = 1 TO 5
540 P = 3
550 IF X = 1 THEN P = 7
560 IF X = 2 THEN P = 4
570 IF GS = 1 THEN GOSUB 610
580 IF GS = 2 THEN GOSUB 650
590 IF GS = 3 THEN GOSUB 740
600 NEXT X:RETURN
610 REM LOAD DATA
620 FOR Y = 1 TO P
630 READ P$:PART$(X,Y) = P$
640 NEXT Y:RETURN
650 REM CHOOSE PARTS
660 Y1 = 0
670 Y = INT ( RND (1) * P ) + 1
680 IF Y = Y1 THEN 670
690 PRINT PART$(X,Y)
700 I = I + 1:PT$(I) =
    PART$(X,Y)
710 IF Y1 <> 0 THEN 730
720 IF X = 1 THEN Y1 = Y:GOTO
    670
730 RETURN
740 REM INVENTORY
750 FOR Y = 1 TO P
760 PRINT PART$(X,Y)
770 NEXT Y:RETURN
```

IDM

Change all HOME statements to
CLS.

Commodore 64/128

Change all HOME statements to
PRINT CHR\$(147).

Correction

In our October issue, there were
errors in the Apple version of the
program called Pop! Delete line 220
and add or replace these lines:

```
90 FOR RA = 1 To 4
110 PO = INT(RND(1) * 19) + 5
115 K$ = ""
```

Send Us Your Programs

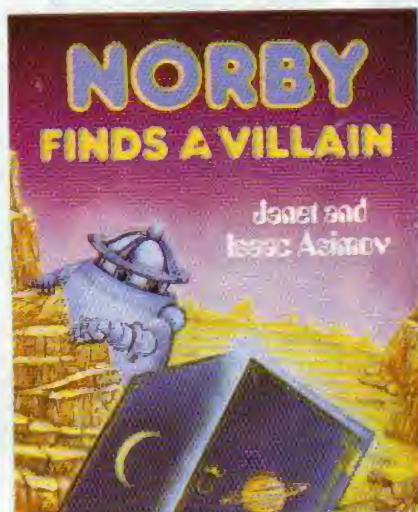
If you've written a program you'd
like us to print, send it in. Include a
note telling us your name, address,
age, T-shirt size and type of com-
puter. If we like it, we'll print it and
send you \$25.

All programs must be your own
original work. We cannot return
programs. Please do not send disks.

Send your program to:

Basic Training
3-2-1 CONTACT Magazine
1 Lincoln Plaza
New York, NY 10023

Reviews



Books

Norby Finds a Villain

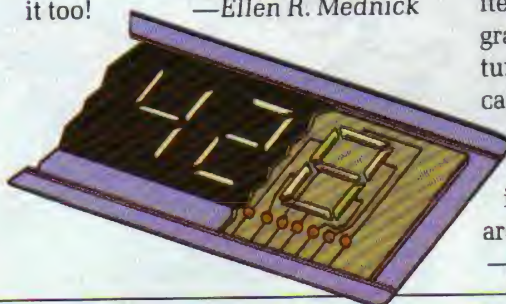
Janet and Isaac Asimov
Walker and Company, \$12.95

Norby Finds a Villain is the sixth book in the Norby series.

This time Jeff, a 15-year-old Earthling, and his clever robot, Norby, team up with freckle-faced, red-haired Rinda and her tiny robot, Pera. Rinda, 11, and Jeff travel through time as they try to out-smart Ing, the Incredible Ingrate.

As they are transported through hyperspace to strange new places, Jeff and Rinda meet up with the "Others," super-intelligent beings from ancient times, and become prisoners of leaf-like aliens called "Biguglies."

Try reading this exciting sci-fi adventure. Your parents will like it too!
—Ellen R. Mednick



How Things Work

by Michael Folsom and Marcia Folsom
Aladdin Books, Macmillan
Publishing Company, 1987, \$8.95

Are you an "Any Questions?" fan? Then you'll love *How Things Work*, which gives you all the basics of how many electrical items work. Complete with diagrams, this book gives you a picture of how everyday objects from calculators to musical instruments are put together. Even the latest inventions like laser discs are included. And the explanations are clear and easy to understand.
—ERM

Software

Beyond Zork

(Infocom, \$40, Apple II; also for most home computers)

The Zork adventure games are among the most popular computer games ever created. And *Beyond Zork*, the newest in the series, adds new game features that will probably make it the most popular of all.

Beyond Zork is a game of magic and of monsters set in an imaginary land. The object is to "solve" the mystery by reading a story.



Then to escape each situation, you must type out a sentence command, such as "Open the door."

While all the other Zork games have only words (and no pictures), *Beyond Zork* has a small map on the screen with the various directions in which you may move. Also in this game, you can use a mouse or keypad with numbers to move from one scene to the next instead of having to type directions.

All in all, this is a wonderful game for the whole family.
—Phil Wiswell

Mini-Put

(Accolade, \$35, Commodore 64/128; also for Apple II, IBM PC)

If you're looking for a simple and relaxing game of miniature golf, then this isn't it! *Mini-Put* is a very difficult golf course—much

harder than anything in real life.

Just as in regular golf, you must get the ball in the hole with the least number of tries. But golf skill won't be enough here! You've got to be clever to avoid all the obsta-



cles. There are greens that slope like the surface of the moon and creatures that can jump up and "swallow" your ball.

This game is fun, but it can really drive you and your joystick crazy. It may be too difficult for some.
—PW

Extra!

by Ellen R. Mednick

Get set for some extra fun in this month's EXTRA!

Weird Wonder?

You've read about some odd-looking animals in this issue. Now try creating an unusual animal of your own. Make sure the animal you design has some special feature that makes it one-of-a-kind. Then explain, in 50 words or less, why you drew it that way. The best drawings will receive CONTACT T-shirts.

Send your T-shirt size, your drawing and short description to:

Weird Wonder
3-2-1 CONTACT
P.O. Box 40
Vernon, NJ 07462



Jingle Jangle

Ready for another juggling trick? Then try your hand—and elbow—with this one!

First, bend your arm, so that the palm of your hand is facing up. Cup your hand toward your elbow. Then place three coins on your elbow. Drop your elbow quickly and smoothly and try to catch the pile of

coins (see drawings).

Hint: It will take a little practice to get the knack of this trick. But keep trying. Just move your hand down and drop your elbow quickly so that your hand is exactly where the coins are.



Now That's Funny!

In our September issue, we asked you to "Be A Comedian" and send us a punch line to this set up: "The other day it rained so much..."

We were flooded with mail. Here are some of our favorites from the thousands of punch lines that came pouring into the office.

"The other day it rained so much..."

I took my goldfish for a walk around the block!"

Shanan Miller
Littleton, CO

"The Coast Guard gave my house a ticket for speeding."

Audrey Buettner
Granada Hills, CA

"My umbrella retired."

Eric Trapper
Binghamton, NY

Moose Thoughts

Dear CONTACT,

Some of us residents of Alaska (especially the moose population) are mildly upset about the fact that you didn't say moose have been making a comeback here too ("Wild Moose Chase," June 1987 issue).

In your article you stated that only New York, Maine, New Hampshire, and Vermont have moose, let alone the moose making a comeback. I am sure that any other states that have moose feel the same way.

Tina Barrigan
North Pole, AK

Dear Tina,

Thanks for your letter. We're delighted that the moose population of Alaska is growing. That's good news for moose—and animal lovers, too!

We Want Mail

We love hearing from our readers. Your cards and letters help us to make CONTACT a better magazine. And you help to keep us on our toes. Send your letters to:

Mail
3-2-1 CONTACT
P.O. Box 40
Vernon, NJ 07462

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Next Month!

Here's a look at some of the exciting features you'll find in the May 1988 issue of CONTACT:

Under the City

Explore the hidden world that lies underneath city streets. It's a strange world of tunnels, paths, and pipes big enough to stand in.


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- 2 CHIPS - CHIP SKIPPER
- 1 CHIP - IMPOSSIBLE! (WE TOLD YOU)
- 0 CHIPS - (WE TOLD YOU)

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